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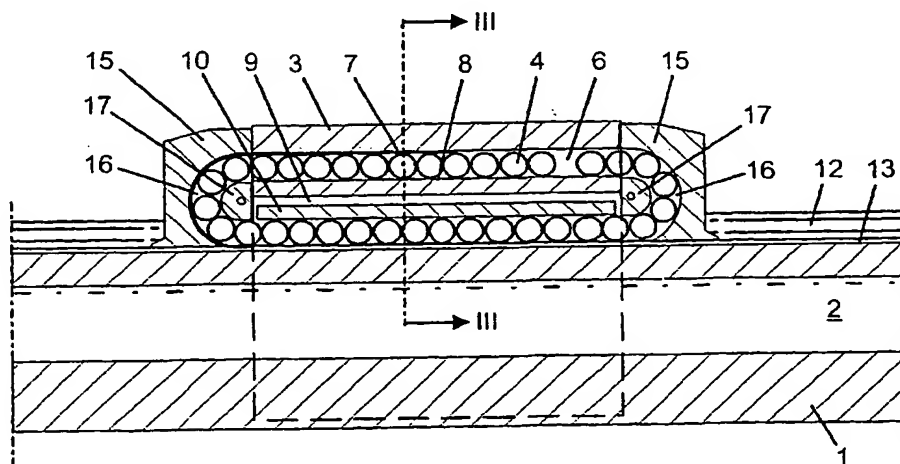
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **ARRANGEMENT AT A SLIDE MOVABLE ON A GUIDE**



(57) Abstract: An arrangement at a slide (3) movable on a guide (1) and provided with longitudinal channels (6), in order to control with rolling elements (4), which travel continuously during operation in the slide (3), the slide at the guide (1). The invention is characterised in that the slide is equipped in connection with the relevant channel (6) with a roller pathway (8) of steel tape in the form of an infinite loop with straight sections (8a, 8b) adapted to the length of the slide, whereby one section (8b) that faces the guide forms a bearing roller pathway under the rolling elements (4) returning from the interaction with the guide. The first section (8b) is held by a spring (9) that acts between the slide (3) and the first section (8b). The continuously curved sections that join the straight sections of the roller pathway (8) extend outside of the ends of the slide and are surrounded each by a roller transfer (15) with a channel (16) open to the curved section of the roller pathway for transfer of the roller elements (4) from the first straight section to the second straight section, for the return of the rolling elements (4) following movement of the slide (3) along the guide (1).

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Arrangement at a slide movable on a guide

The present invention concerns an arrangement at a slide, movable on a guide, according to the introduction to claim 1.

5 Control systems of the type intended here in the form of a slide, movable on a guide with the aid of rollers or balls, are previously known, one form of such is one in which the rolling elements follow the guide linearly during movement of the slide with the aid of roller guides, which move during the movement of the slide at half of the speed of the slide. See, for example, the Swedish patent document 506 402. The
10 disadvantage of these systems is that there is a risk that the roller guides with their rolling elements will be displaced from their initial positions during movement with subsequent disadvantages. Another form is one in which the rolling elements circulate in the slide. The slide and the guide must in this case be manufactured from hardened steel with ground rolling paths of high precision, in order to achieve as little
15 play as possible and in order that the rolling elements should not deform the rolling path in the slide at high load or as a result of wear. It is expensive to manufacture these systems.

The present invention is intended to make the use of the latter system possible, but with the use of relatively cheap material, such as, for example,
20 aluminium in the guide. Furthermore, quiet operation is obtained through the invention, as this is revealed in the characterising elements of the claims, and it is possible to use extruded slides and guides with a length that is, in principle, without limit.

The invention will now be described in more detail in the form of examples
25 with reference to the drawings, in which **Figure 1** shows schematically a longitudinal section I-I in Figure 2 through one part of a guide, on which guide a slide can move, **Figure 2** shows schematically, for the purpose of clarification without shading a cross-section through a guide with a slide that moves on it, **Figure 3** shows a section III-III in Figure 1, **Figure 4a** and **Figure 4b** show schematically one item that is part
30 of the slide from the side and from the top, respectively, and **Figure 5** shows schematically another item that is part of the slide.

Reference numeral 1 in the drawings refers to a guide of extruded light metal with a cavity 2 that extends the complete length of the guide. A slide 3 straddles the
35 guide 1 (see Figure 2) and can be moved with the aid of rollers 4 that run against the guide 1 and that circulate in the slide 3. The slide 3 offers a longitudinal channel 6 with a width so adapted that the rollers 4 can move without hindrance in the channel 6. The channel 6 is provided on the surface that faces outwards with tracks that face

sidewards and a steel tape 7 is inserted into these tracks (see Figure 2 for more details), stretching along the complete slide 3. A roller pathway 8 in the form of an infinite steel tape with two straight surfaces 8a, 8b and two curved sections that unite these surfaces (see also Figure 4a and Figure 4b) is arranged in the slide 3 such that one straight section (8b) of the roller pathway is located at the bottom or at the side of the channel 6 that faces the guide, and the second straight section (8a) is primarily located at the height of the side of the slide that faces the guide. The roller pathway 8 is cut through diagonally at one straight section (8c) in order to make it possible to mount the roller pathway 8 in the slide 3, and such that the rollers will pass the cutting 8c without any disturbing noise. A spring 9 in the form of two longitudinal cambered steel tapes is arranged between the straight section 8b of the roller pathway 8 that faces the guide and the slide 3 (see Figure 3 for more detail), which extend along the complete slide 3. A spacer in the form of a longitudinal steel tape 10 is arranged (inserted) between the roller pathway 8b and the spring in order to distribute the spring force of the spring to the straight section 8b of the roller pathway.

The guide 1 demonstrates channels 12 that correspond to the channels 6 of the slide 3. A steel tape 13 that extends along the guide is inserted at the bottom of each channel 12, located in tracks 14 arranged in the channel 12. The rollers 4 will run between the straight section 8b of the roller pathway 8 and the steel tape 13 during movement of the slide along the guide.

A roller transfer 15, is arranged at each end of the slide 3, and it is appropriate if these transfers are made of plastic. The transfers demonstrate a channel 16 that surrounds and opens onto the curved section of the roller pathway 8, which extends beyond the end of the slide 3. Thus the rollers 4 can move from being in contact with the guide 1 and around along the curved section of the guide 8 within the channel 16 until they are located in a return movement between the section 8a of the roller pathway and the steel tape 7 with an even movement that is guided by the roller 8. The roller transfer 15 is provided with a controlling part 17, the shape of which fills the space between the end of the slide 3 and the curved part of the roller pathway 8 that extends outside of the slide. By mounting each roller transfer 15 during assembly such that the controlling part 17 extends into the said space, the two interacting roller transfers 15 will, with the aid of the control parts 17, fix the roller pathway 8 and the roller transfers 15 relative to each other and at the slide 3. A cover of appropriate design (not shown) locks each roller transfer 15 in the sideways direction relative to the slide 3 and the roller pathway 8, and it is appropriate that this cover is screwed, glued or attached with button-fasteners to the relevant roller transfer 15.

It is to be understood that the slide and the guides can have another design of cross-section than that shown here; the number can be different; and the longitudinal channels can be placed differently. In the same way, it is to be understood that balls can be used in the place of rollers 4.

- 5 In order to reduce the friction of the rollers 4 in each channel 12 of the slide 3, and in order to reduce the level of noise from the rollers when in use, plastic longitudinal side-supports 18 can be placed on each side in the relevant channel 12 of the guide 1 (see Figure 3), and it is appropriate that these side-supports 18 are controlled with the aid of protruding beads that engage side-tracks in the channel 12.
- 10 A further measure is to arrange plastic spacers between the rolling elements.

Claims

1. An arrangement at a slide (3) movable on a guide (1) and provided with longitudinal channels (6), in order to control with rolling elements (4), which travel continuously during operation in the slide (3), the slide at the guide (1),
- 5 characterised in that the slide is equipped in connection with the relevant channel (6) with a roller pathway (8) of steel tape in the form of an infinite loop with straight sections (8a, 8b) adapted to the length of the slide, whereby one section (8b) that faces the guide (1) forms a bearing roller pathway for the roller elements, which roller pathway lies over, when seen from the guide (1), the rolling elements (4), which
- 10 interact with the guide (1), and the second section (8a), which faces away from the guide, forms a bearing roller pathway under the rolling elements (4) for the rolling elements returning from the interaction with the guide, that the first section (8b) is held by a spring (9) that acts between the slide (3) and the first section (8b), that continuously curved sections that join the straight sections of the roller pathway (8)
- 15 extend outside of the ends of the slide and are surrounded each by a roller transfer (15) with a channel (16) open to the curved section of the roller pathway for transfer of the roller elements (4) from the first straight section to the second straight section, for the return of the rolling elements (4) following movement of the slide (3) along the guide (1).
- 20 2. The arrangement according to claim 1, characterised in that each roller transfer (15) is equipped with a controlling part (17) arranged such that it extends, when the roller transfer (15) is assembled with fit, into the space formed by the end of the slide (3) and the section of the roller pathway (8) that extends outside of this, in this way fixing the roller pathway and the roller transfers (15) relative to
- 25 each other and at the slide (3).
3. The arrangement according to claim 1 or 2, characterised in that roller pathways (13) in the form of steel tape are arranged that extend along the guide at the bottom of channels (12) for the rolling elements⁽⁴⁾ inserted into the guide (1).
- 30 4. The arrangement according to claim 1, 2 or 3, characterised in that side supports (18) extend on each side of the rolling elements (4) between the roller transfers (15), running in channels (12) in the guide⁽¹⁾ intended for the rolling elements (14).
5. The arrangement according to claim 2, 3 or 4, characterised in that
- 35 the roller transfers (15) consist of plastic.
6. The arrangement according to any one of the preceding claims, characterised in that the rolling elements (4) consist of rollers.

7. The arrangement according to any one of claims 1-5,
characterised in that the rolling elements (4) consist of balls.
- _____

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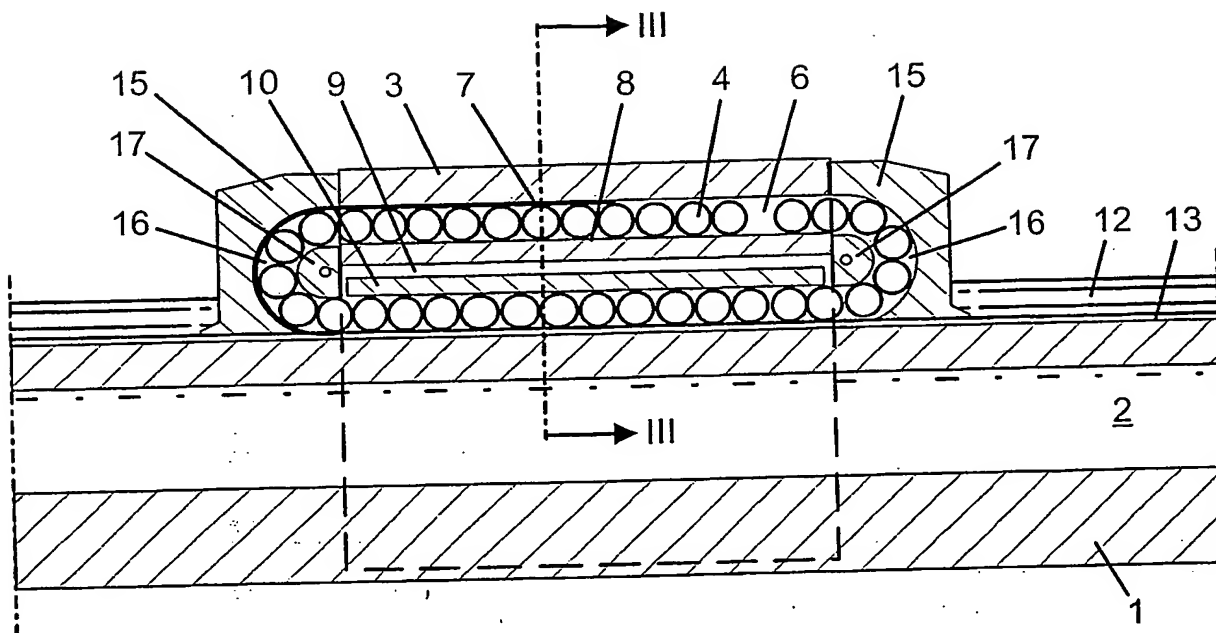


FIG. 1

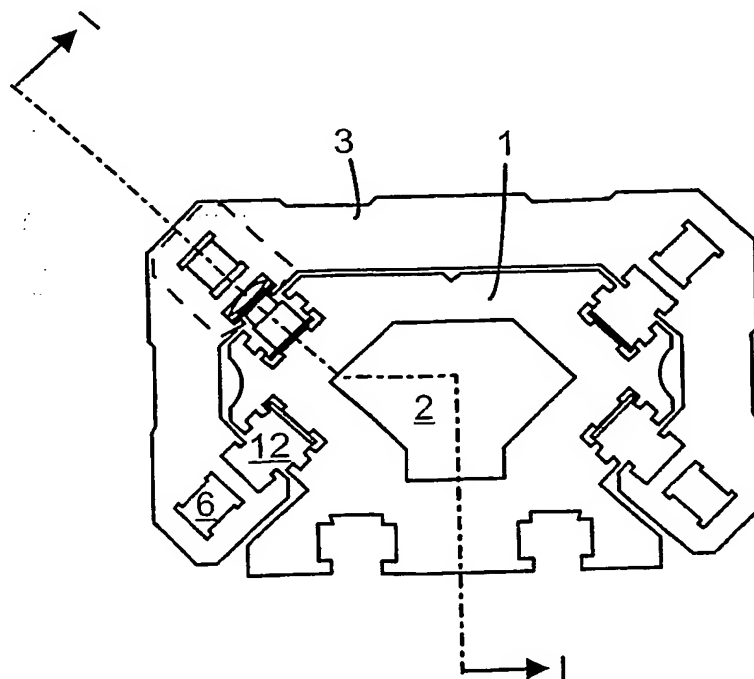


FIG. 2

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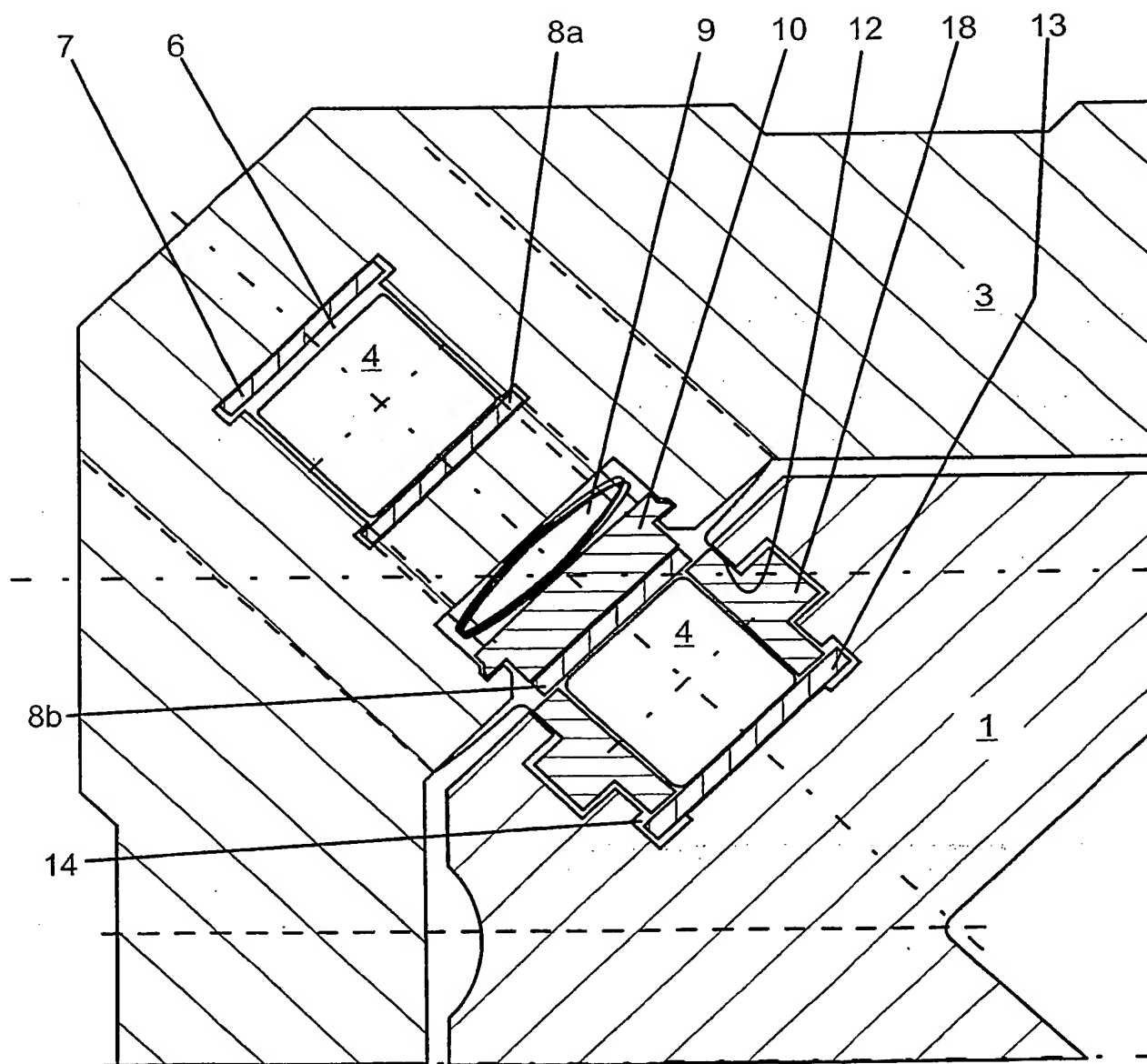


FIG. 3

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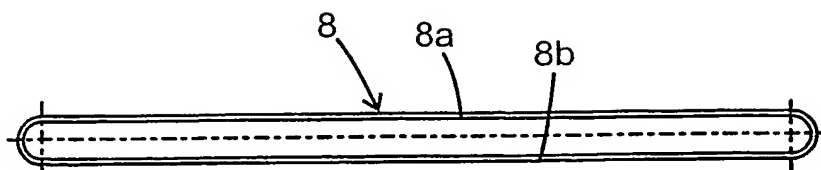


FIG. 4a

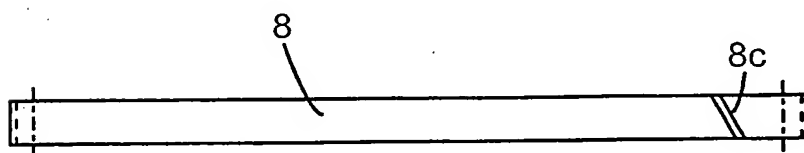


FIG. 4b

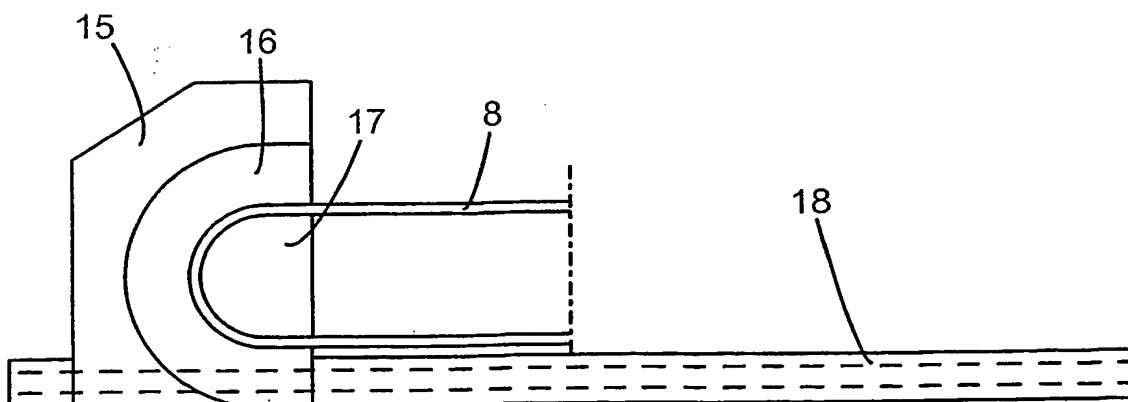


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 02/02059

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: F16C 29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: F16C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5496113 A (L. WINKELMANN ET AL), 5 March 1996 (05.03.96), figure 2, abstract --	1-7
A	GB 2282420 A (INA WÄLZLAGER SCHAEFFLER KG), 5 April 1995 (05.04.95), figure 2, abstract --	1-7
A	EP 0846880 A1 (THK CO. LTD.), 10 June 1998 (10.06.98), figure 1, abstract -- -----	1-7

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Further documents are listed in the continuation of Box C.

☒

See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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